

## TITLE OF THE INVENTION

Information Terminal

## FIELD OF THE INVENTION

5           The present invention relates to an information terminal such as a personal computer or the like incorporating a wireless function such as mobile phone, and more particularly to an information terminal reinforced in an anti-theft function for as IC memory device or the like used for a wireless function.

## BACKGROUND OF THE INVENTION

10           Recently, a wireless function such as a mobile phone is built in an information terminal such as a laptop computer and is used for exchanging information with an outside. The global system for mobile communication (GSM) is a mobile phone system distributing widely overseas, except Japan, 15 such as Europe, Asia and North America. A feature of this system is to separate a mobile phone terminal and an operator with using a subscriber identity module (SIM) card. In this system, when a user purchases a mobile phone, he/she selects first a mobile phone (terminal) and then selects an arbitrary company as the operator to be used. 20

          At this moment, the operator issues an IC card called the SIM card in which the subscriber information (telephone number) is written. The user contracts with an arbitrary operator, and receives the SIM card, loads the card into the mobile phone terminal, and has terminal be ready to use 25 immediately. If using a different terminal, the user exchanges the SIM card, and the other terminal can be used in the same telephone number. The user, upon having another SIM card issued by other operator, can select

plural operators for one terminal.

The SIM card contains the telephone subscriber's right, and thus, if being stolen, the card may be used illegally. If being incorporated in the device, the SIM card may be rarely stolen. However, for the usage where a  
5 card selected from plural SIM cards, and is removed from one terminal and inserting into other terminal, the card is demanded to insert and remove easily.

## SUMMARY OF THE INVENTION

10 An information terminal, which an SIM card or other memory card is easily inserted to and removed from, is reinforced in an anti-theft fuction. The terminal includes the follows:

A case having a section for accomodating a detachable memory device;

15 A locking device provided in the case, which is changed between a locked state and an unlocked state with a key;

A lid for covering the section for accommodating the memory device in the case; and

20 An interlocking lock-mechanism for interlocking with the locking device for closing the lid at the locked state and opening the lid at the unlocked state.

## BRIEF DESCRIPTION OF THE DRAWINGS

25 Fig. 1 is a perspective bottom view of an information terminal according to exemplary embodiment 1 of the present invention.

Fig. 2 is an essential magnified perspective exploded view of the information terminal.

Fig. 3 is an essential magnified perspective view of the information terminal as seen from the opposite side of Fig. 2.

Fig. 4 is a perspective bottom view of an information terminal according to exemplary embodiment 2 of the invention.

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## DESCRIPTION OF THE PREFERRED EMBODIMENTS

### (Embodiment 1)

Referring to the drawings, an information terminal according to exemplary embodiment 1 of the present invention as a laptop computer will be explained. Fig. 1 is a perspective bottom view of an information terminal according to exemplary embodiment 1 of the present invention. Fig. 2 is an essential magnified perspective exploded view of the information terminal. Fig. 3 is an essential magnified perspective view of the information terminal as seen from the opposite side of Fig. 2.

10 In Fig. 1, in a case 1, a liquid crystal display unit is usually disposed, and a lid 3 opening downward in the diagram with a hinge not shown is provided. In the center of the front side of the case 1, a carrying handle 7 is attached. At the front side of the bottom, a bottom lid 5 is locked with slide lock devices 9 and 11. At the left side of the handle 7, a cylinder lock 13, a  
15 locking device to be locked and unlocked with a key 12 is provided. The slide lock device 9 usually moves manually to the left, and the slide lock device 11 moves manually to the right, so that the bottom lid 5 can be opened.

In Fig. 2, a first recess 15 is provided at the bottom side of the case 1.  
25 A rotation arresting shaft 17 is rotatably projecting nearly from the center of the recess by penetrating through the side wall at right angle. An arresting part 19 at the front leading end of the shaft extends in the horizontal

direction as illustrated. At the opposite side (inner side of the case 1) of the arresting part 19, a lever unit 23 having a pin hole 21 is formed on the rotation arresting shaft 17.

At the first recess 15, a guide plate 31 is fixed at a hole 35 of the first  
5 recess 15 with a screw 33 passing through the screw hole 27. The guide plate 31 has a notch 25, a screw hole 27, and a round hole 29 through which the rotation arresting shaft 17 penetrates. A cross section of the guide plate 31 in the vertical direction has an inverted convex form narrower at the side contacting with the first recess 15. That is, parallel upper and lower ends  
10 at the front side of the figure form guide rails 37, 39.

The slide lock device 9 is inserted into the guide plate 31 in the direction of an arrow A from the right side prior to be mounted at the first recess 15. The slide lock device 9 has an arresting part 41 and a guide part 43 provided in the lateral direction above and below to be fitted to the guide  
15 rails 37, 39, respectively, and is inserted into the guide plate 31 to slide right and left.

The slide lock device 9R is a rear side view of the slide lock device 9. A groove 45 extends to an inside in the longitudinal direction, and a lock part 47 expands in a circular form in the middle. The arresting part 19 of the  
20 rotation arresting shaft 17 is put into the groove 45. When the arresting part 19 rotates at the middle of the lock part 47 by 90 degrees from the state shown in the diagram, the arresting part 19 becomes long in the vertical direction, and arrests the slide lock device 9 (9R) in the lateral direction.

In Fig. 2 and Fig. 3, a key hole 49 is formed in the cylinder lock 13.  
25 The key 12 inserted into the hole and rotated by 90 degrees in the direction of an arrow B rotates a shaft 51 together with the key hole 49. And a cam plate 53 formed integrally with the shaft 51 is also rotated to be changed in a

locked state. The cam plate 53 also operates as a power source locking device. The key 12 can be preferably removed from the key hole 49 at the locked state and unlocked state.

5 A power source lever 55 can be turned by about 30 to 45 degrees in the direction of an arrow C coaxially with the shaft 51. When the power source lever 55 turns, an extension lever 57 formed integrally therewith also turns to push up an actuator 61 of a power switch 59, and turns the power switch 59 on. The rotation is limited depending on the position of the cam plate 53.

10 Herein, the actuator 61 of the power switch 59 pushed up turns the power switch on. In the personal computer conforming to the ATX standard, when the actuator 61 is first pushed up, the power switch is turned on, and when the actuator 61 is pushed up next time, the power switch is turned off. That is, the power switch 59 can operate to change a state of the present terminal for the power source sequentially to other state.

15 The power source lever 55, extension lever 57, power switch 59, and actuator 61 are totally called a power switch device. The power switch device may include a circuit operating to change a present terminal state of the power source sequentially to other state with every operation of the actuator 61. The cam plate 53 and the lever 23 of the rotation arresting shaft 17 are coupled with a coupling rod plate 63 and pins 65, 67. The  
20 rotation arresting shaft 17 rotates by 90 degrees in the direction of an arrow D by the coupling rod plate 63 according to the rotation of the cam plate 53 by 90 degrees in the direction of an arrow B. The rotation arresting shaft 17, coupling rod plate 63, and others are totally called an interlocking lock-  
25 mechanism.

At the end of the bottom lid 5, an arrested part 69 projects downward in an L-form, is inserted into a second recess 71 formed in the first recess 15,

and is arrested by the arresting part 41 of the slide lock device 9. The slide lock devices 9, 11, guide plate 31, and arrested part 69 are totally called a lid locking device. The end face of the side confronting the end face attached to the arrested part 69 of the bottom lid 5 may be latched by an inserting as  
5 usual or affixed with the case 1 with a hinge or the like.

In the inside 73 of the case 1, a card socket 75 is disposed to load a SIM card 77 as a memory device.

An operation of the information terminal having such configuration will be explained below. While the bottom lid 5 opens, the SIM card 77 can  
10 be loaded and unloaded in and from the card socket 75 at the inside 73. While the bottom lid 5 closes, and while the slide lock device 9 is manually slid in the direction of an arrow A, the arrested part 69 is arrested by the arresting part 41. The slide lock device 11 similarly operates to fix the bottom lid 5.

The key 12 inserted into the key hole 49 and turning by 90 degrees in  
15 the direction of an arrow B until stopped locks the cylinder lock 13. Further, the cam plate 53 cooperating integrally with the shaft 51 is turned by 90 degrees in the direction of an arrow B to be located at the position indicated by a single dot chain line. Therefore, the extension lever 57 cannot move in  
20 the direction of an arrow C. Therefore, the power source lever 55 cooperating with the lever cannot be manipulated, so that the power switch 59 cannot be turned on by the actuator 61 moving upward. Hence, any third party cannot manipulate the terminal to use a communication function without permission and to disguise and steal data.

25 Simultaneously, the cam plate 53 upon being turned, rotates the rotation arresting shaft 17 by 90 degrees in the direction of an arrow D through the coupling rod plate 63. Therefore, the arresting part 19 becomes

longer in the vertical direction within the lock part 47 of the groove 45. As a result, the slide lock device 9 is prevented from sliding in the lateral direction, and the arrested part 69 remains stopping in the arresting part 41. Therefore, any third party cannot steal the inside memory by opening the  
5 bottom lid 5. This is the locked state. When the key 12 is removed from the cylinder lock 13 at this state, any third party not having the key cannot manipulate the information terminal or cannot open the back lid.

To unlock it, the key 12 is inserted into the key hole 49, and turned by 90 degrees in the direction of an arrow C until stopped, so that the cylinder  
10 lock 13 is unlocked. In the reverse operation to the above case, the power source lever 55 can turn, the power switch 59 can be turned on, and the slide lock device 9 can be slid, so that the bottom lid 5 can be opened.

The key 12, upon being inserted and turned in the direction of an arrow C, once unlocks the cylinder lock 13. Then, the power source lever 55,  
15 upon being turned in the direction of an arrow C presses the actuator 61 of the power switch 59 through the extension lever 57, thereby turning on the power source of the laptop computer, i.e., the information terminal. Then, upon being turned in the direction of an arrow B, the key 12 locks the cylinder lock 13, and then, key 12 can be pulled out. As a result, while the  
20 laptop computer is turned on, the power source lever 55 cannot be turned again in the direction of the arrow C, so that the power source cannot be turned off. In a computer conforming the ATX standard, when the power switch is manipulated again while the computer is turned on, the power is turned off. Hence, the computer is prevented from destruction or  
25 elimination of data being entered by intentional or accidental power off operation by the power source lever 22. This is an effective function for preventing loss of data by an incorrect operation in an exhibition hall or

show room attended by unspecified multiple people.

In the embodiment, the SIM card is loaded in the bottom lid 5. A hard disk device, battery, wireless circuit board or the like can be also accommodated.

5 Thus, according to the embodiment, locking the cylinder lock as the locking device disables an on/off operation of the power switch and disables the bottom lid to be opened. Therefore, the information terminal cannot be manipulated by third party, and the SIM card or other important parts accommodated in the bottom lid can be protected from theft. The terminal  
10 can be locked under being turned on and prevented from being turned off by a third party not having the key. The terminal itself can not be theft, not explained herein, with a arresting part (not shown) provided on the case fixed to the desk or the like with a wire or the like.

15 (Embodiment 2)

Referring to Fig. 4, an information terminal according to exemplary embodiment 2 of the present invention will be explained as a laptop computer. In the perspective bottom view of the information terminal in Fig. 4, the same parts as in embodiment 1 are denoted by the same reference  
20 numerals, and the explanation is simplified. A lock lever 79 is coupled with a pin 65 to a cam plate 53 formed integrally with a shaft 51 of a cylinder lock 13. The guide mechanism is omitted for simplicity. The terminal is set in a locked state when the key is inserted in a key hole 49 and turned 90 degrees in the direction of an arrow E from the shown position. The lock  
25 lever 79 projects in the direction of an arrow G and is inserted into a locked part 81 provided in a bottom lid 5a to arrest a bottom lid 5a. Herein, the lock lever 79 functions as an interlocking lock-mechanism. Under this state,



a power source lever 55 cannot be turned, and the power switch cannot be turned on.

For unlocking it, the key is inserted in the key hole 49 and turning 90 degrees in the direction of an arrow F, and the lock lever 79 is pulled in the direction of an arrow H. Thus, the bottom lid 5a can be taken out, and the power source lever 55 can be turned.

In embodiment 1, the bottom lid 5 is locked indirectly by arresting the slide lock device 9 allowing the bottom lid 5 to be fixed and opened. In embodiment 2, the bottom lid 5a itself is locked directly.

These embodiments are only examples, and constituent elements for composing these embodiments may be replaced by other parts having similar functions including known components. For example, the locking device in the embodiments is mechanically operated with a key, but may be replaced by a cipher number. With entering a cipher number electronically through numeric keys, for example, when the numbers are matched, the device may be unlocked with an electromagnetic force.

Described values are only examples and not limited. For example, the key is turned by 90 degrees, but the angle is not limited to 90 degrees only.

In these embodiments, the communication system is the GSM system, and the SIM card is used. But the wireless communication system is not limited to it, and the embodiments are applied in all other methods using similar ID cards and vulnerable to theft problems. The embodiments are applied to the memory device, but may be applied to other devices for not only storing data, but also operating stored data by incorporated programs and operation unit.

The embodiments are explained with a laptop computer, but are

applied to information terminals including a desktop computer incorporating a wireless communication function and a small portable information terminal having a wireless communication function used for the same purpose generally known as a personal digital assistant (PDA).

5       As explained herein, in the information terminal of the invention, the locking device set to a locked state disables an power switch-on operation and disables the bottom lid to be opened. Therefore, the information terminal cannot be handled by any third party, and at least a card storing information such as the SIM card incorporated in the bottom lid, hard disk,  
10 battery, wireless circuit parts and other important components can be protected from theft.

In this information terminal, in relation to a manipulation in the locked state, the power switch-on operation and a change from the on-state to an off-state can be disabled. Therefore, the information terminal is  
15 prevented from a manipulation, destruction, and erasure of data by third party.